RESEARCH PROBLEM STATEMENT #RW-504

I – Problem Title

Creating standards and specifications for Laser Scanning (ground based Lidar) use on Caltrans projects.

II – Research Problem Statement

Laser scanning measures thousands of points per minute to produce a very detailed "point cloud." Design data such as models, lines, points, or surfaces are extracted from the point cloud and exported to CAiCE or Microstation. Standards should be created and the best uses for this technology within Caltrans defined.

III – Objective

To produce laser scanning standards for use internally and on consultant contracts. This research supports the Department's goal of safety by creating unequaled as-builts and keeping surveyors out of traffic.

IV – Background

Laser scanners are increasingly being used by private firms to measure and model buildings, bridges, highways, slide areas, large surface areas, and archeological sites. The large amounts of data collected allows very detailed modeling of surfaces. Traditional survey instruments are limited to locating one point at a time. Laser scanning has the potential to be safer and more efficient than some of our current methods. Caltrans also needs to define which types of projects this technology should be used on. It a new technology that will allow highway structures to be modeled that have not been possible with traditional surveying instruments.

V – Statement of Urgency and Benefits

The potential of this technology to gather large amounts of data quickly and safely has the potential to revolutionize data collection and modeling.

VI – Related Research

1. Jaselskis, Edward et al. Pilot Study on Improving the Efficiency of Transportation Projects Using Laser Scanning. Research Report CTRE PROJECT 02-109, Center for Transportation Research and Education, Iowa State University, Ames, Iowa,
2. B.C Ministry of Transportation Emerging Technology Committee. 3-Dimensional Digital Laser Scanning and Point Cloud Scan data translated to CAiCE Visual Transportation Deliverable. 2004

VII – Deployment Potential

The research product will be standards of use for laser scanning and recommendations as to the best use. The has the potential to be used by all the survey crews within Caltrans collecting survey data and consultants.